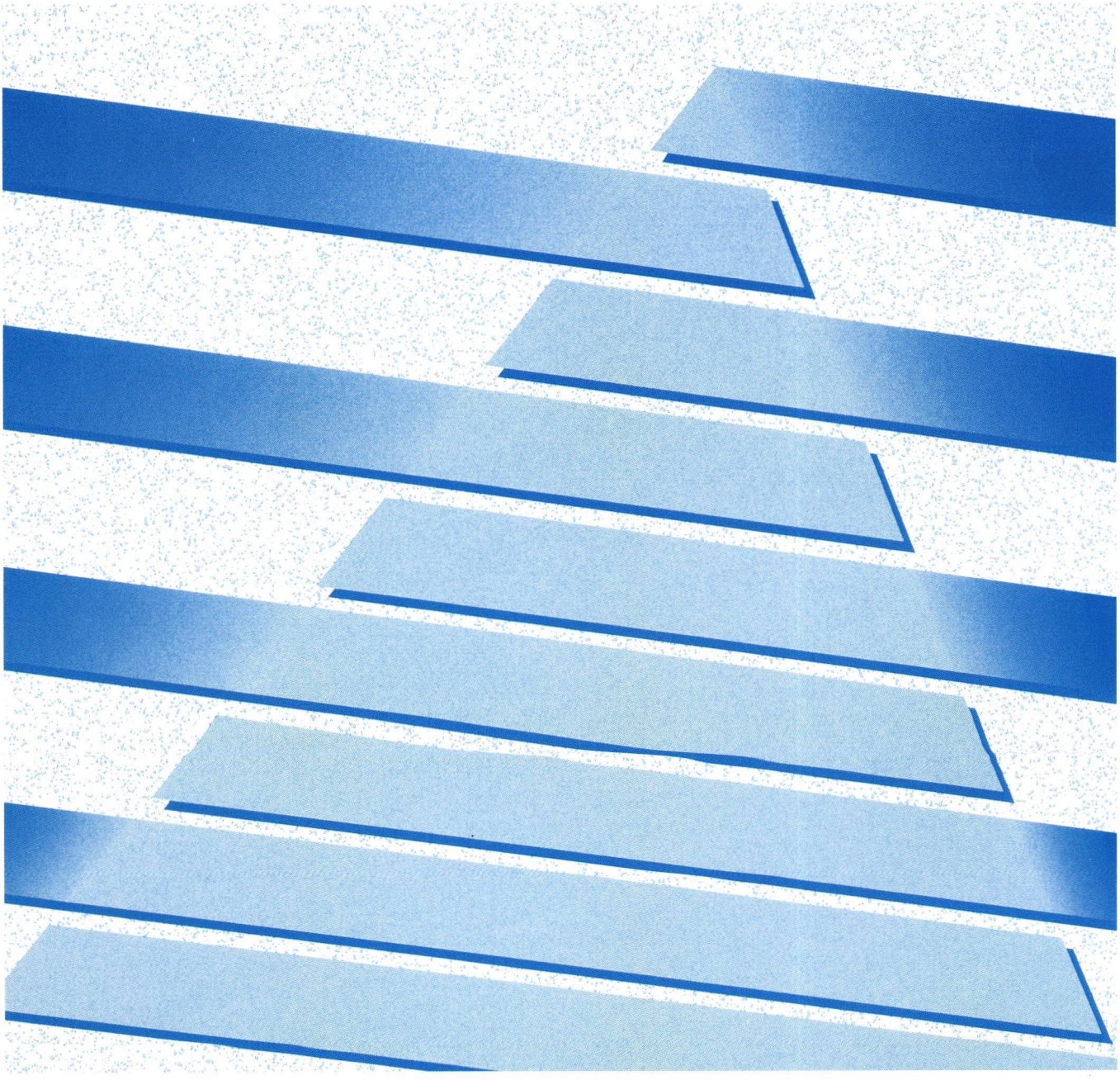
ALLEN-BRADLEY

ControlView™ Alarming

(Cat. No. 6190-ALM)

User Manual



Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley Company, Inc. does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley Publication SGI-1.1, "Safety Guidelines for the Application, Installation and Maintenance of Solid State Control" (available from your local Allen-Bradley office) describes some important differences between solid-state equipment and electromechanical devices which should be taken into consideration when applying products such as those described in this publication.

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ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss.

Attentions help you:

- identify a hazard
- avoid the hazard
- recognize the consequences

Important: Identifies information that is especially important for successful application and understanding of the product.

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Summary of Changes

Changes from Release 2.0 to 3.0

The following changes have been made to the Alarming option and the Alarming User Manual since release 2.0:

For information on this new feature:	Refer to:	The feature appeared in:
Installation instructions for the Alarming option have been moved to the *ControlView Installation Manual.*	ControlView Installation Manual	software release 3.0
Alarm database information is now imported/exported from within ControlView, not DOS, using the same commands as general database import/export.	ControlView Core User Manual, Appendix D	software release 3.0
ALARMON command /H parameter starts alarm handshaking when alarm monitoring begins	Chapter 1, Appendix A	software release 2.11
ACKNOWLEDGEALL command acknowledges all alarms	Chapter 1, Appendix A	software release 2.11

Preface

How To Use This Manual

This manual describes the features and capabilities of the Alarming option, a component of the ControlView™ system. The Alarming software enables database tags to be monitored for alarm conditions, and controls the logging, printing, and screen display of alarm information and alarm acknowledgement. Information related to alarming is saved as part of the ControlView database.

This manual supplements the information in the *ControlView Core User Manual*. It contains information on:

- alarming concepts
- adding alarms to the database
- alarm acknowledgment
- alarm logging
- the alarm summary

Conventions Used in This Manual

This manual follows the print conventions outlined in the *ControlView Core User Manual*.

Audience

The Alarming software, once installed, is a part of ControlView. You should be familiar with ControlView and have the *ControlView Core User Manual* available for reference. A list of related publications is contained in that manual.

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Chapter 1

Introduction

Alarms are an important part of most plant control applications, since the operator must know the instant something goes wrong. It is often equally important to have a record of the alarm and of the fact that it was acknowledged by an operator.

In ControlView, you can set up a complete alarming system, as well as test and run it, using the Setup and Actions menus or the command line.

You can link Alarm commands to keys or key combinations, or (with the Event Detector option) to events built into the system. Alarm information can also be shared with other ControlView options such as Mouse GRAFIX™ displays, Event Detector or a custom C-Toolkit program.

Summary of Alarming Features

The Alarming option offers a wide variety of features:

- any tag in the Current Value Database—up to 2000 at a time—can be monitored
- analog tags can have up to 8 alarm thresholds
- alarm thresholds can be specified as constants or as relative values which change dynamically
- digital tags can be monitored for alarms in five different ways
- 8 different alarm severity classes determine how and where alarms will be logged and/or printed
- for maintenance and system tuning purposes, you can suppress alarms
- the alarm banner shows the most severe, most recent unacknowledged alarm
- the Alarm Status display shows the number of unacknowledged and suppressed alarms
- the Alarm Suppression list shows the complete information on suppressed alarms
- you can link a macro to every alarmable tag
- alarm information can be shared with other ControlView options

Alarm Concepts

An alarm occurs when something goes wrong. It could signal that a device or process has ceased operating within acceptable, pre-defined limits, or indicate breakdown, wear, or a step out of sequence.

You set up a system of alarms in the Database Editor, by adding alarm links to any tags you want to monitor. When those tags values are updated in the Current Value Database, they are compared to the limits you have assigned them in the editor. If the values exceed the preset limits, an alarm of a preset severity is triggered.

The alarm subsystem can be turned on and off; when it is off, alarmable tags are not scanned, and system load is reduced.

Alarm Severity

The severity of an alarm indicates its importance in your application. When you define the alarm, you can assign one of eight possible severity levels: 1 is the most severe and 8, the least severe level. For example, a severity 4 alarm may warn that a vat is half full of liquid while a severity level 1 alarm may warn that it is about to overflow. Both alarms are monitoring the same tag, but they have different severities.

You can set up alarms of a given severity to be sent to specific printer, or logged to a specific destination. Severity also determines the order in which the alarm is displayed in the Alarm Banner, and the color of the text display in both the Alarm Banner and the Alarm Summary.

Digital Alarms

Digital alarms monitor digital tags. Digital tags are either on or off. Therefore, there are no threshold settings for digital alarms The five types of digital alarm are shown below.

Table 1.A
Digital Alarm Types

On	The tag is considered in alarm whenever a tag has a value of 1.
Off	The tag is considered in alarm whenever the tag has value of 0.
COS (change of state)	Reports an alarm any time the value of the bit changes: from 0 to 1 or 1 to 0.
COS On	Reports an alarm only when a 0 changes to 1.
COS Off	Reports an alarm when a 1 changes to a 0.

Important: All COS types are considered out-of-alarm immediately after the change of state.

Analog Alarms

Analog alarms monitor analog tags. A single analog tag can trigger a number of alarms when it crosses various predefined threshold levels.

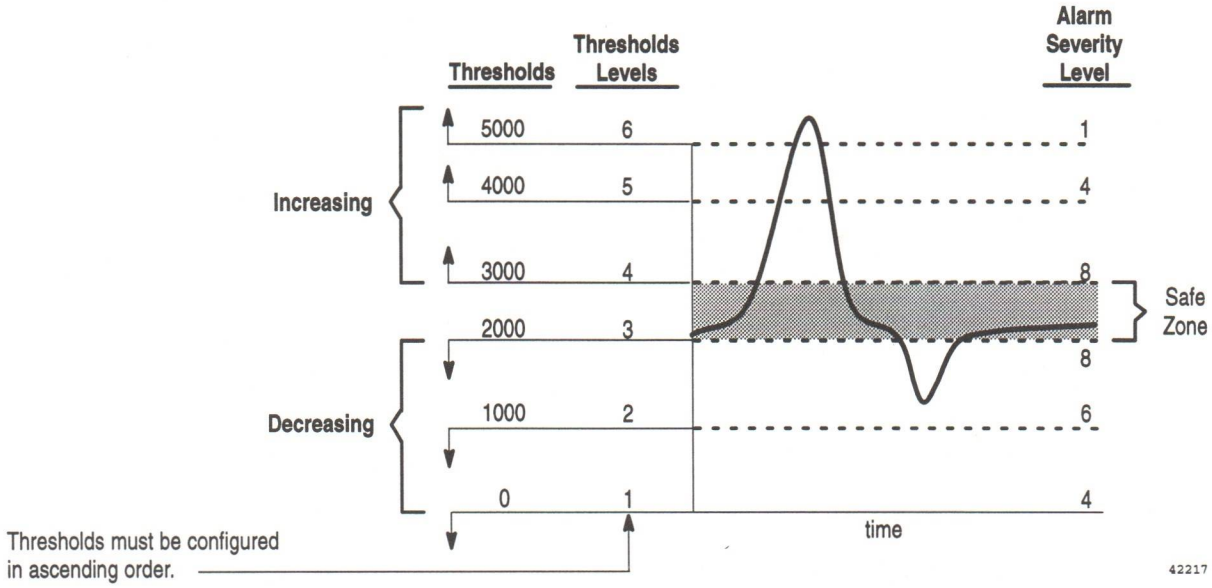
Thresholds

When you define an analog tag, you can assign it up to eight alarm thresholds with different levels of alarm severity. The lowest threshold is 1 and the highest is 8. You don't need to use all eight thresholds for one tag, but when you're configuring an alarm with several thresholds, you must configure the lowest threshold setting, then the next lowest, and so on. For example, you could create thresholds 1, 2, 5, and 8, as long as you create them in ascending order.

Thresholds can be increasing (monitoring for a rising value which hits the threshold) or decreasing (monitoring for a falling value which hits the threshold). The following illustration shows a tag with both increasing and decreasing thresholds. For the purposes of the example, assume that the deadband setting is 0.

Example: Alarm Thresholds

Figure 1.1
Alarm Thresholds



The previous illustration charts the changing values of a tag monitoring a motor's RPM. With the threshold settings illustrated, the motor must run between 2000 and 3000 RPM, or an alarm will be triggered.

If the motor speed:	An alarm of this severity is triggered:
exceeds 3000 RPM	8
exceeds 4000 RPM	4
exceeds 5000 RPM	1
falls below 2000 RPM	8
falls below 1000 RPM	6
stops (0 RPM)	4

Threshold values can be constant or variable The above example uses constant thresholds. A variable threshold can change, since its value is taken from another tag value, not a constant number. You define a variable threshold by naming a tag in the appropriate field in the editor. That tag's value is the threshold for the alarm; as the tag changes, the threshold changes.

Alarm Faults

A variable threshold must not become higher than the threshold above it; or lower than the threshold below it. If this happens, an alarm fault is generated for the monitored tag. To correct an alarm fault, you must re-configure the variable threshold in such a way that it does not overlap either of its neighbors.

This can become complex when the neighboring thresholds are themselves variable, since these boundaries are determined dynamically at run time. Be careful to avoid creating situations where variable thresholds can overlap, otherwise an alarm fault can occur.

Important: When an alarm fault is generated, the following events occur:

- the tag's alarm status stays where it was before the alarm fault
- an alarm fault is reported to all configured alarm reporting devices (e.g. printers, log files)
- in the Current value Database, the alarm fault status bit for the tag is set; this allows other applications to recognize that an alarm fault has been generated
- the tag label in the Alarm Summary display states that the tag is in "Alarm Fault"

When the variable thresholds at fault are returned to their normal operating range, the alarm fault condition is cleared. The out-of-alarm-fault status is generated and logged, and alarms for that tag resume normal operation.

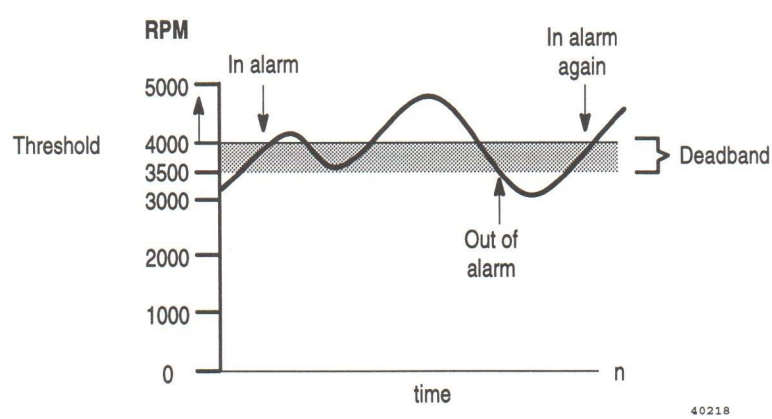
Variable thresholds require more system resources than constant thresholds. This is due to the continuous scanning of threshold values and to the processing necessary to detect alarm faults.

Deadband

With certain kinds of processes such as line pressure, tag values can fluctuate rapidly above and below a critical threshold. Where such conditions exist, you can create a "deadband" as a buffer zone to prevent the fluctuations from triggering and re-triggering unnecessary alarms. If the threshold is increasing (monitoring rising values), the deadband range lies below the threshold. If decreasing (monitoring falling values), it lies above the threshold.

The following illustration shows an increasing threshold of 4000 RPM with a deadband value of 500 RPM. In this example, the RPM would have to fall to 3500, then rise above 4000 RPM before the alarm would re-trigger.

Figure 1.2
Alarm Deadband



A deadband range may be absolute, as illustrated, or it may be a percentage of the Minimum/Maximum range set for a given point. If the deadband in the illustration above were configured to 2%, its range would be 2% of 5000, which is 100 RPM.

If a buffer zone is not required, the deadband must be configured to 0 (zero). With a deadband of zero, alarms will be triggered as soon as the tag value crosses any of its thresholds.

Monitoring Alarms

Alarm Messages

You can configure your alarms so that when points go into or out of alarm, and/or when alarms are acknowledged, and/or when alarm faults occur, an alarm message can be sent to such destinations as:

- the Alarm History log files
- the Alarm Summary display and the Alarm Banner
- any available printer
- an internal or external bell.

Logging destinations are configured through the Alarm Severity Table and its associated screens.

ControlView comes with a predefined set of default messages for in-alarm, out-of-alarm and acknowledge events. You insert these default messages in the appropriate fields automatically, by accepting them without any change. You can also change any of them to create your own default messages.

You can also create unique file and printer messages for any and all alarmable tags in the database. You can send any message you like to a printer, but file messages must conform to certain standards if the information will be useful by other software options:

Important: Do not create unique file messages for any tag. if you intend to generate reports from the Alarm History log files. The optional Reporting module cannot read the log files and produce reports unless the messages are in the default format.

The Alarm Summary Display

The Alarm Summary lists all alarm transactions including current and past alarms, and indicates whether or not they have been acknowledged. The Summary can hold a maximum of 440 transactions. As new alarms occur, they appear at the top of the list. When the Alarm Summary becomes full, one alarm is dropped from the bottom of the list for each new alarm that appears at the top. Alarms are dropped from the Alarm Summary when they are both out-of-alarm and acknowledged.

The Alarm Summary can be set to be a full-sized or smaller window. It uses three different elements to facilitate viewing: severity color, flashing alarm time, and white display text.

Severity Color

You can set the color of the alarm to be red, yellow or blue. You can choose to configure low severity alarms as yellow, medium severity as blue and high severity as red. When the alarm is displayed, you can tell its severity at a glance.

Flashing Time Field

The time of the alarm is listed to the left of each alarm in the Summary. If the alarm is unacknowledged, the time field will flash in whatever severity color you chose in the Severity Color field. As soon as the alarm is acknowledged or goes out of alarm, the time field stops flashing.

White Text Display

When a tag has gone out-of-alarm but is still not acknowledged, the alarm and out-of-alarm listing in the summary are displayed in white.

White text is also used to identify alarm faults. In addition, a tag label notes that the alarm is in fault.

The Alarm Status Display

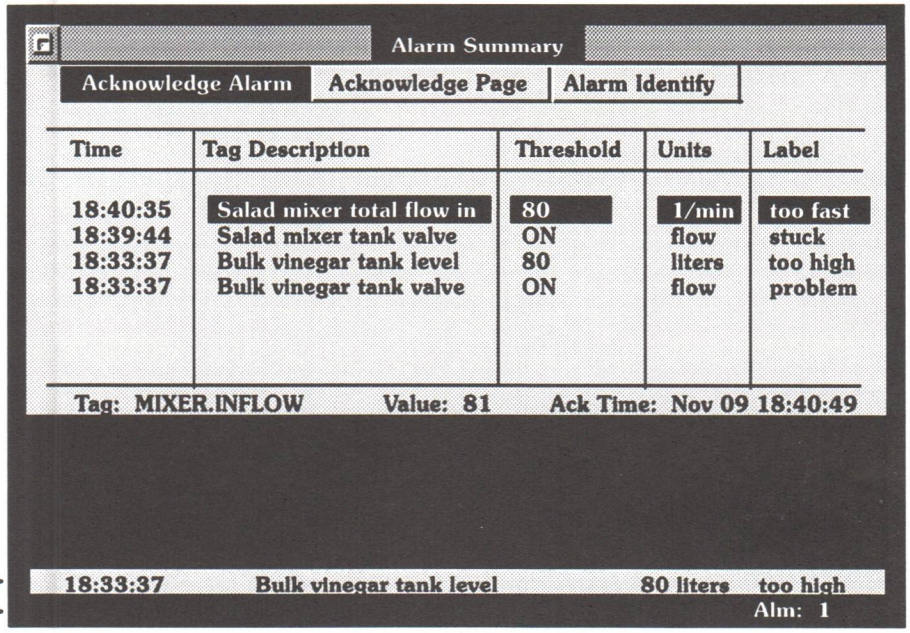
The Alarm Status Display appears at the bottom right of the screen whenever there are unacknowledged and suppressed alarms.

Important: Alarms can be suppressed for maintenance and system tuning purposes. Go to *Suppress Alarms*, under Tags in the Actions menu, or use the SUPPRESSON command from the command line.

The Alarm Banner

The Alarm Banner is a single line display near the bottom of the screen that reports the most recent, most severe alarm. If an alarm with a higher severity occurs, it will replace the first alarm, whether or not the previous alarm has been acknowledged.

Figure 1.3
The Alarm Summary, Alarm Banner and Alarm Status Displays



Alarm Banner
Alarm Status Display

Important: The Alarm Banner and the Alarm Status Display appear whenever there is an outstanding alarm.

Alarm Acknowledgment

In most applications an operator acknowledges an alarm. This does not correct the condition causing the alarm, but simply indicates that it has been recognized.

Important: You can only acknowledge alarms which are configured to be sent to the Alarm Summary. Alarms sent to only the printer, to disk or to sound off bells, do not require acknowledgment.

It is important to note that a *tag*, not an alarm, is acknowledged. A single tag might have caused several alarms. For example, a tag representing temperature might have triggered WARM , HOT and OVERHEAT alarms by the time the report is acknowledged. The tag could also have gone in and out of alarm several times before being acknowledged.

One acknowledgment is all that is required for all previous and current alarms for a tag. Consequently, Alarm History log files often show fewer acknowledgments than alarms.

You acknowledge an alarms either:

- by choosing *Acknowledge Alarm*
- by using the ACKNOWLEDGE command (by itself, or using parameters to name a tag or group of tags)
- by using the ACKNOWLEDGEALL command

Unless an alarm is acknowledged, it remains outstanding until the system is shut down, or until the Alarm Summary is full (440 tags in alarm).

Alarm IDENTIFY: Linking a Command or Macro to an Alarm

The IDENTIFY feature runs a macro (or command) that is named in the alarm's definition. One good use for this feature is to display operator instructions on what to do about an alarm. For example, you could create a macro that would display instructions for the operator on how to handle a motor that was overspeed.

To run the IDENTIFY macro, double–click on the alarm in the Alarm Summary, (or highlight the alarm and choose *Alarm Identify*). Or, use the IDENTIFY command described in Appendix A, *Commands*.

Suppressing Alarms

When plant equipment is serviced or tuned, use the SUPPRESSON command to suppress alarm detection and avoid false alarms. Once suppressed, alarms can be reactivated with the SUPPRESSOFF command. The SUPPRESSED command will call up the Alarm Suppression List, which lists the tag names and descriptions of all suppressed alarms. See Appendix A, *Commands* for more details on commands.

Wildcard Characters

Use wildcard characters to refer to groups of tags with similar names or which have certain characters in common.

Table 1.B
Wildcard Characters

This character:	has this function:	Example:
?	matches any single character	acknowledge ???.vin
*	all tags in one level of the database	acknowledge mixer.*
+	when the + follows a group name, all tags in the current group and the groups it contains	acknowledge mixer.+
	when the + precedes a point name, all the tags that have that point name	acknowledge +.level
	when there are no group names, all tags in the database	acknowledge +

Handshake Bit

You can enable or disable a handshake bit so that, when an alarm is generated for a tag, another PLC or ControlView station can determine its alarm status. By default, handshaking is off. To turn on handshaking:

- use the HANDSHAKEON command
- use the ALARMON command with the /H parameter. By using the /H parameter, you turn on handshaking at the moment alarming starts, and also set the handshake bit for any tags which are in alarm at the moment that alarm monitoring begins

Disable handshaking with the HANDSHAKEOFF command. The handshake bit can be reset whether or not handshaking is enabled.

Alarm Information Available to Application Modules

The following alarm information is available to any application module that uses expressions, including Derived Tags, Mouse GRAFIX, Data Logger, and Event Detector.

- Alarm Status (in- or out-of-alarm)
- Alarm Severity
- Alarm Threshold Level Crossed
- Alarm Acknowledged
- Alarm Fault
- Alarm Suppressed

Importing and Exporting Alarm Database Information

The alarming information in the tag database can be exported in plain ASCII files which are separate from the main database. ASCII files containing alarm database information can also be imported into ControlView. This can be useful if you want to use the database data for other purposes, such as spreadsheets or other database programs.

The *ControlView Core User Manual*, Appendix D, *Importing and Exporting Data*, describes how to to import and export database information. Refer to that manual for details.

Chapter 2

Setting up an Alarm System

This chapter describes how to use the Database Editor to add alarm settings to tags in the database. For complete instructions on how to create and edit your database, refer to the *ControlView Core User Manual*, Chapter 3, *The Setup Menu.*

The First Steps

1. Choose *Edit Database*, under Configure in the Setup menu. A small window appears listing the databases available.

2. Choose a database, and the Configure Database window will appear with the name, type and description of the tags in the database.

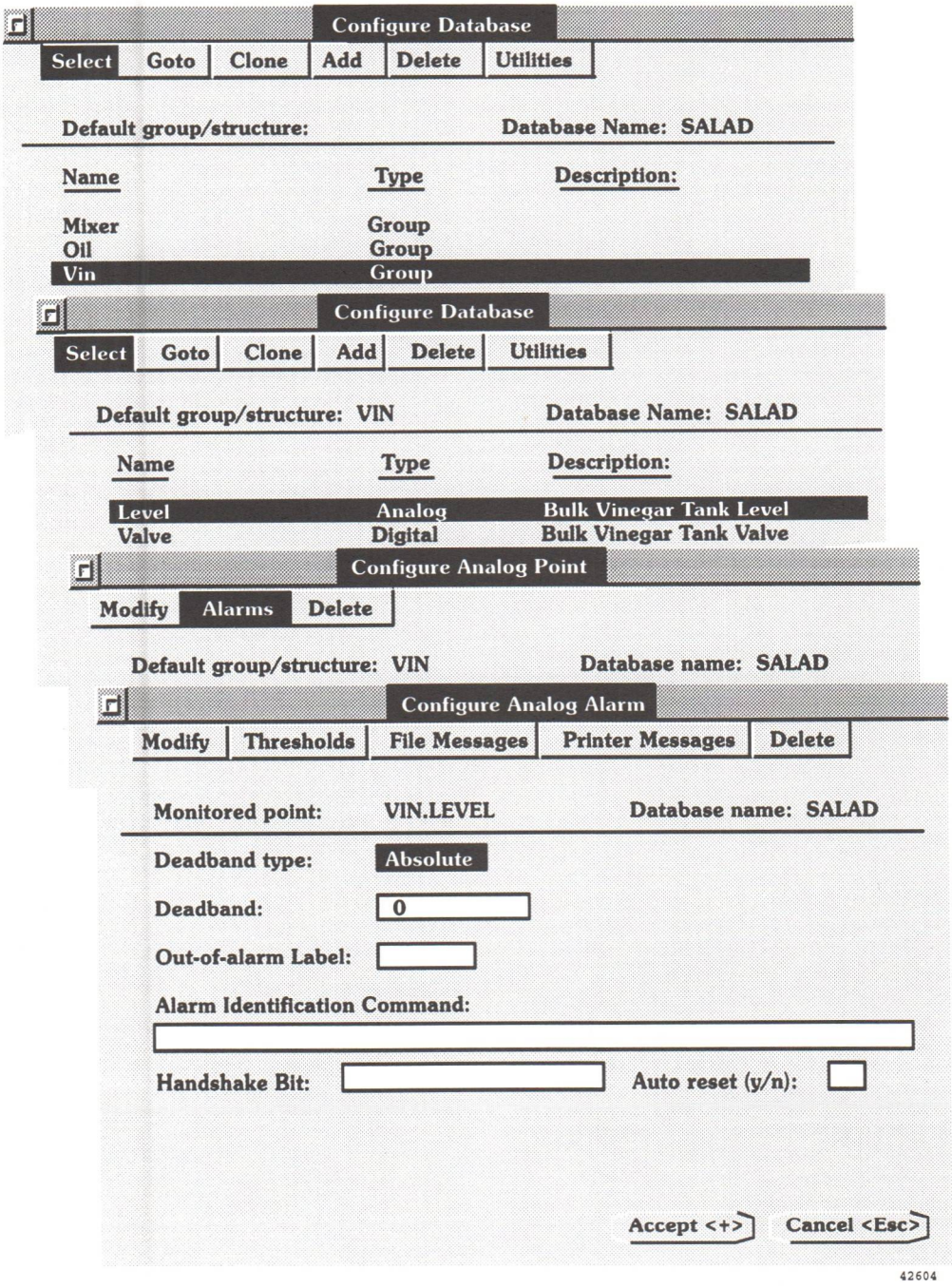
3. Choose a tag to monitor for alarms. If the tag belongs to a group, you will have to complete an additional step by choosing a single tag from the group.

Depending on the tag type you choose, either the Configure Analog Point window or the Configure Digital Point window will appear.

Configuring Analog Alarms

Figure 2.1 follows the process of selecting an analog point, opening the Configure Analog Point window, and choosing Alarms to edit an analog alarm. The process is the same for choosing a digital point, but the configuration window is slightly different.

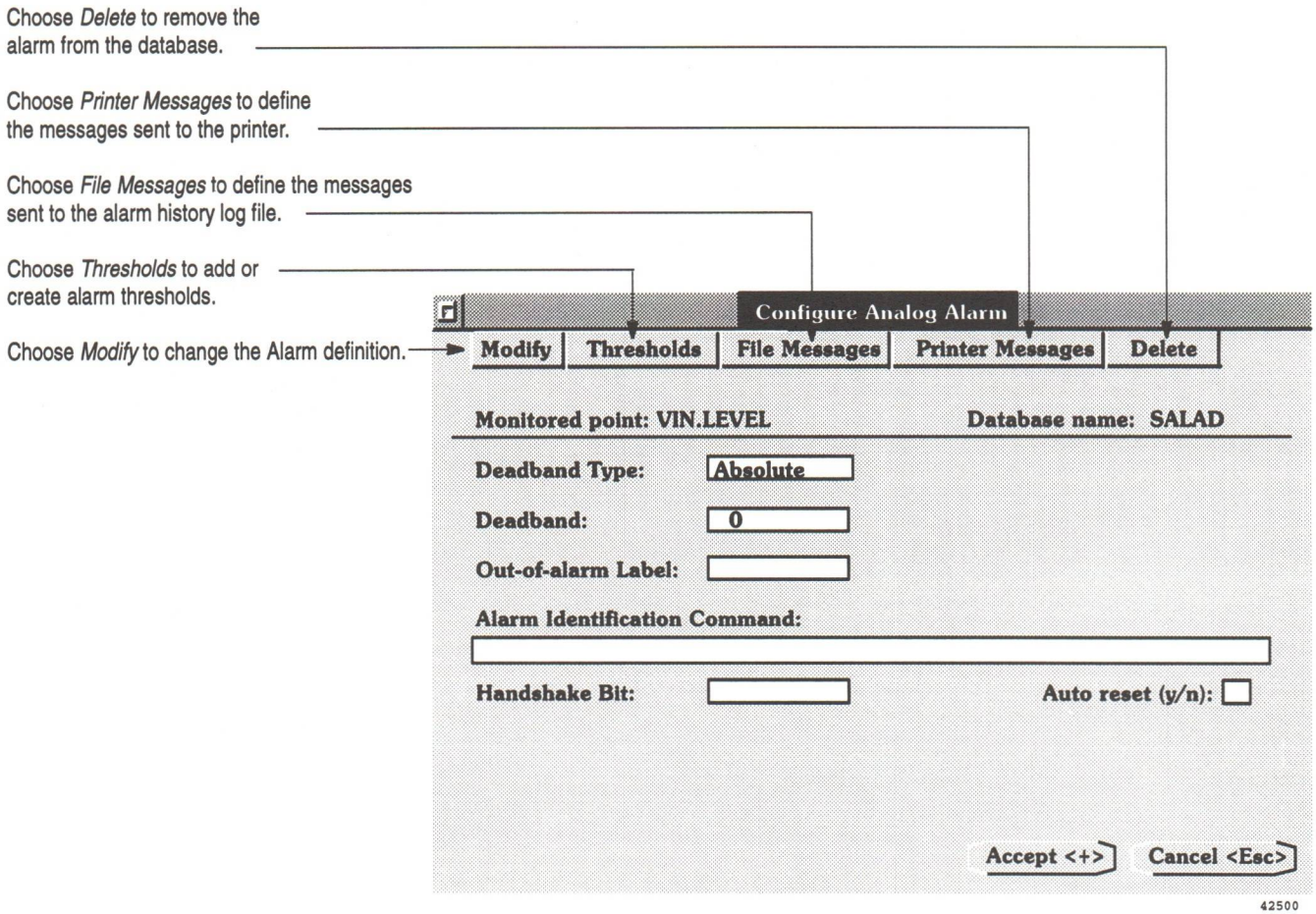
Figure 2.1
Getting to Alarm Configuration



The Configure Analog Alarm Window

Choose *Modify*, and the fields in the window become active.

Figure 2.2
The Configure Analog Alarm window



- Deadband Type

  Select *Deadband Type,* and a list will appear with two choices: *Absolute*, for an absolute value, or *Percent*, for a percentage of the tag's minimum/maximum range.

- Deadband

  The alarm deadband is a buffer zone on the edge of an alarm threshold. The tag is not considered out-of-alarm until its value is inside the "normal" range specified by the deadband value.

- Out-of-Alarm Label *(Optional)*

  Type in the text message that you want to be displayed in the Alarm Summary when the monitored tag changes to out-of-alarm.

- Alarm Identification Command (IDENTIFY) *(Optional)*

  Enter a command or macro name. This command or macro will run when you highlight the alarm in the Alarm Summary and choose *Alarm Identify*; or alternately, with the IDENTIFY command.

- Alarm Handshake Bit and Auto-Reset *(Optional) (one per tag)*

  You can configure the alarm so that a handshake bit is set in the programmable controller whenever the alarm is triggered. The programmable controller can then react quickly to the alarm. In the Handshake Bit field, name the tag which refers to the handshake bit's address.

  By default, the handshake bit is disabled; to enable it, use either the HANDSHAKEON command, or use the /H parameter with the ALARMON command. The HANDSHAKEOFF command disables handshaking.

  The handshake bit is set only once per alarm—when the alarm is generated. The bit can be reset automatically when the tag goes out of alarm, or the programmable controller can reset it.

  Press **Enter** on the Auto-reset field. To select automatic reset, choose *Y*; for the programmable controller to reset it, choose *N*.

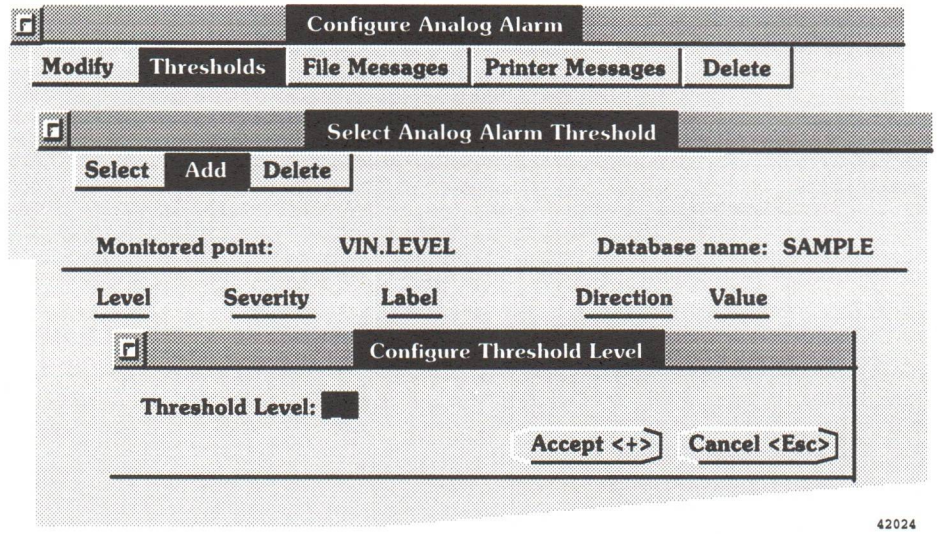
Important: If you shut down ControlView with the QUIT command after the handshake bit has been set, the bit might remain on indefinitely. Auto-reset handshake bits are not automatically reset at each startup.

ATTENTION: If several tags name the same handshake bit, and some or all of them have auto-reset enabled, the handshake bit could switch off and on unpredictably. If you must use the same handshake bit for more than one alarm, be sure the programmable controller resets the handshake bit.

Adding or Creating Alarm Thresholds

In the Configure Analog Alarm window, choose *Thresholds* to open the Select Analog Alarm Thresholds window.

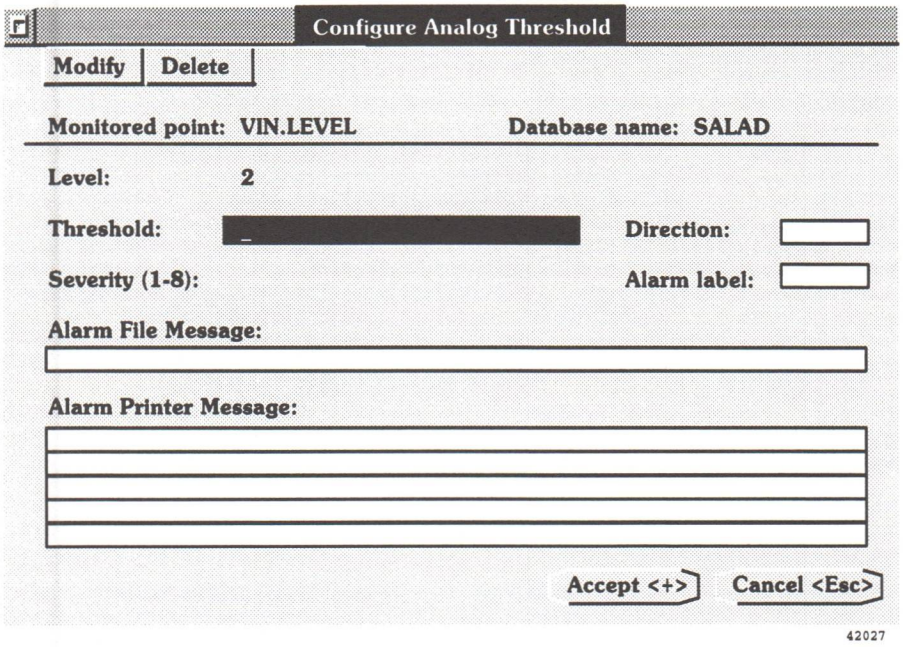
Figure 2.3
The Select Analog Alarm Threshold Window



- To change an existing threshold, highlight the threshold level in the list and choose *Select*. The Configure Analog Threshold window will appear.

- To add a threshold, choose *Add*. The Configure Threshold Level window will appear. Type in the threshold level number and press **Enter** to display the Configure Analog Threshold window.

Figure 2.4
The Configure Analog Threshold Window



The Configure Analog Threshold window includes the following fields:

- Threshold *(up to eight thresholds per tag)*

  The alarming system compares the current value of tag against the threshold values. If the tag value has crossed a threshold value, the point is in alarm. These threshold values can be constant or variable. For more information on thresholds, refer to Chapter 1, *Introduction*, in the section on Analog Alarms.

  To define a constant threshold, select *Threshold* and enter the value.

  To define a variable threshold, select Threshold and name a tag in the database. At runtime, that tag's value will be the alarm threshold; as the tag value changes, so will the alarm threshold.

  Do not create a variable threshold whose value could become higher than its upper neighbor's value, or could fall below its lower neighbor's value. If this happens an alarm fault will be generated. Refer to Chapter 1, *Introduction*, in the section on Alarm Faults.

- Direction *(one per threshold)*

  To monitor for a rising value, select an increasing threshold (positive direction ↑). To monitor for a falling value, choose a decreasing threshold (negative direction ↓).

- Severity *(one per threshold)*

  Severity defines the importance of the alarm generated when a threshold is crossed. Alarm severity ranges from 1 to 8 (1 is the most severe). When the tag is not in alarm, the severity level is 0.

  Highlight the *Severity* field. Choose a severity value, 1 to 8, from the list of numbers that pops up.

  There are several other attributes that can be assigned to each severity level. These are configured in the Alarm Severity Table, described later in this chapter.

- Alarm Label *(one per threshold)*

  Type in a description, up to 10 characters, to be displayed in the Alarm Summary and Banner when the tag goes into alarm. Each threshold level has its own alarm label.

- Alarm File and Alarm Printer Messages

  Type in any messages to be sent to the Alarm History log files and/or the printer when the tag goes into alarm. The alarm file message is one line of up to 80 characters. The printer message can be up to five 80 character lines. The Alarm Message Special Characters described later in this chapter can be used to automatically insert the current tag name, time, and date into your message.

Important: Do not create unique file messages for a tag if you intend to generate reports from the Alarm History log files. The Reporting option can only read the log files and produce reports if the messages are in the default format.

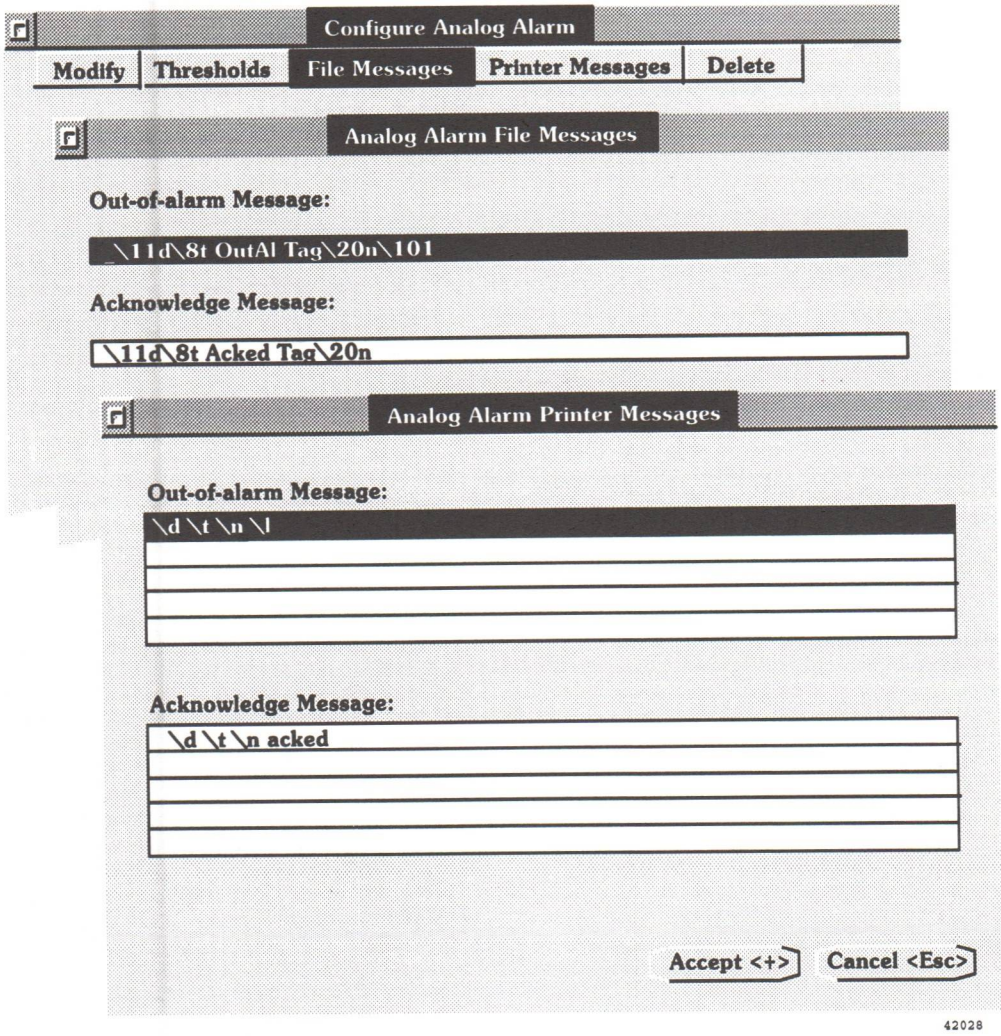
Important: If you do not need individual messages for each alarm, you can use the system-wide default messages in the Default Alarm File Messages window and the Default Alarm Messages window. (Figure 2.11).These messages will appear by default if you leave the message fields blank in any threshold's definition. To create your own system-wide defaults, edit the messages in the Default Alarm File Messages window and the Default Alarm Messages window.

Important: Alarm messages will only be sent to the printer or Alarm History log files if they have been configured to do so in the Alarm Severity Configuration window (Figure 2.9).

File and Printer Messages for Out-of-Alarm and Acknowledge

To create messages to send when the tag goes out-of-alarm, or when the operator acknowledges the alarm, choose *File Messages* in the Configure Alarm window.

Figure 2.5
Analog Alarm File/Printer Message windows



- Out-of-Alarm Message

  The out-of-alarm message is logged when the monitored tag goes from being in-alarm to out-of-alarm.

- Acknowledge Message

  The acknowledge message is logged when the alarm condition is acknowledged by the operator.

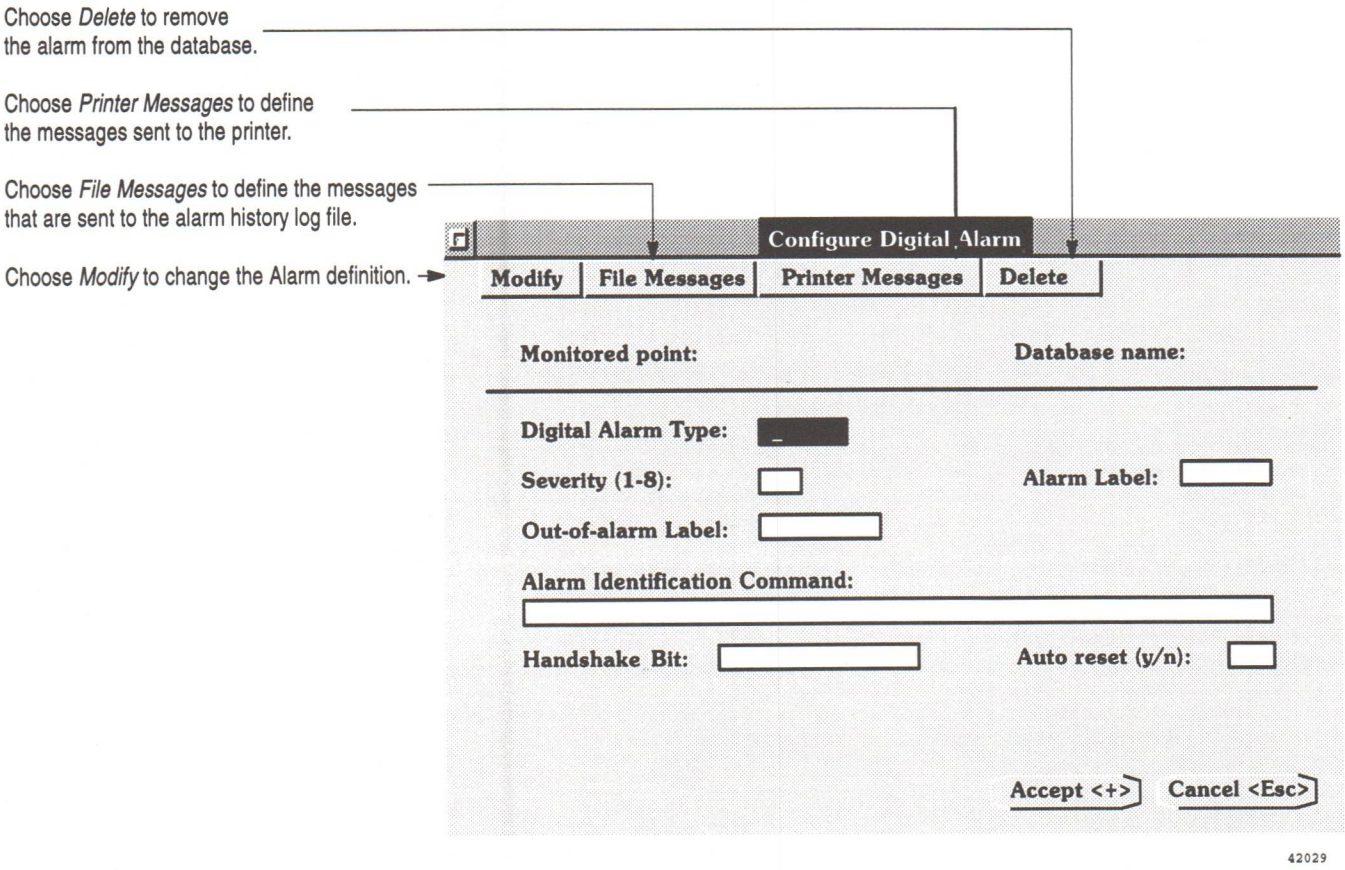
Important: Out-of-alarm, alarm fault and acknowledge messages will only be sent to the printer or Alarm History log files if they have been configured to do so in the Alarm Severity Configuration window (Figure 2.9).

Configuring Digital Alarms

To configure a digital alarm, begin with the First Steps described at the beginning of this chapter. Briefly:

1. From the Setup menu, open the Configure menu.
2. Choose *Edit Database* and select a database to work on.
3. Select a digital tag to edit, and the Configure Digital Point window opens.
4. Choose *Alarms*. The Configure Digital Alarms window appears. This is where configuration starts.

Figure 2.6
Configure Digital Alarm



This window differs slightly from the Configure Analog Alarm window, because digital alarms are one of five types, and they have no thresholds. Choose *Modify* to access the Configure Digital Alarm window fields.

- Digital Alarm Type

  Press **Enter** on this field, and choose one of the following alarm types from the list that pops up.

Table 2.A
Digital Alarm Types

On	The tag is in alarm whenever it has a value of 1.
Off	The tag is in alarm whenever it has value of 0.
COS	Reports an alarm any time the value changes: from 0 to 1 or 1 to 0.
COS-On	Reports an alarm only when a 0 changes to 1.
COS-Off	Reports an alarm only when a 1 changes to a 0.

Important: The three COS (Change Of State) alarms are almost instantaneous; they are in-alarm only for the moment of change. Because the alarm is transient, the out-of-alarm message is not generated, the alarm status bit is not written to the Current Value Database, and the acknowledge status bit in the Current Value Database is reset to *not acknowledged.*

- Severity

  Enter a number, 1 to 8 for the severity of this alarm. The most severe level is 1, the least severe is 8.

  There are several attributes that can be assigned to each severity level. These are configures in the Alarm Severity Table, described later in this chapter.

- Alarm Label

  Type in a description, up to ten characters, to be displayed in the Alarm Summary and Banner when the tag goes into alarm. Each alarm has its own alarm label.

- Out-of-Alarm Label

  The out-of-alarm label is a ten-character description that is displayed in the Alarm Summary when the monitored tag goes out of alarm. Each alarm has its own out-of-alarm label.

- Alarm Identification Command (IDENTIFY) *(Optional)*

  Enter a command or macro name. This command or macro will run when you double–click on the alarm in the Alarm Summary, or highlight it and choose *Alarm Identify*; or alternately, use the IDENTIFY command.

- Alarm Handshake Bit and Auto-Reset *(Optional) (one per tag)*

  You can configure the alarm so that a handshake bit is set in the programmable controller whenever the alarm is triggered. The programmable controller can then react quickly to the alarm. In the Handshake Bit field, name the handshake bit's address.

  By default, the handshake bit is disabled; to enable it, use either the HANDSHAKEON command, or use the /H parameter with the ALARMON command. The HANDSHAKEOFF command disables handshaking.

The handshake bit is set only once per alarm—when the alarm is generated. The bit can reset automatically when the tag goes out of alarm, or the programmable controller can set it.

Press **Enter** on the Auto-reset field. To select automatic reset, choose *Y*; for the programmable controller to reset it, choose *N*.

Important: If you shut down ControlView with the QUIT command after the handshake bit has been set, the bit might remain on indefinitely. Auto-reset handshake bits are not automatically reset at startup.

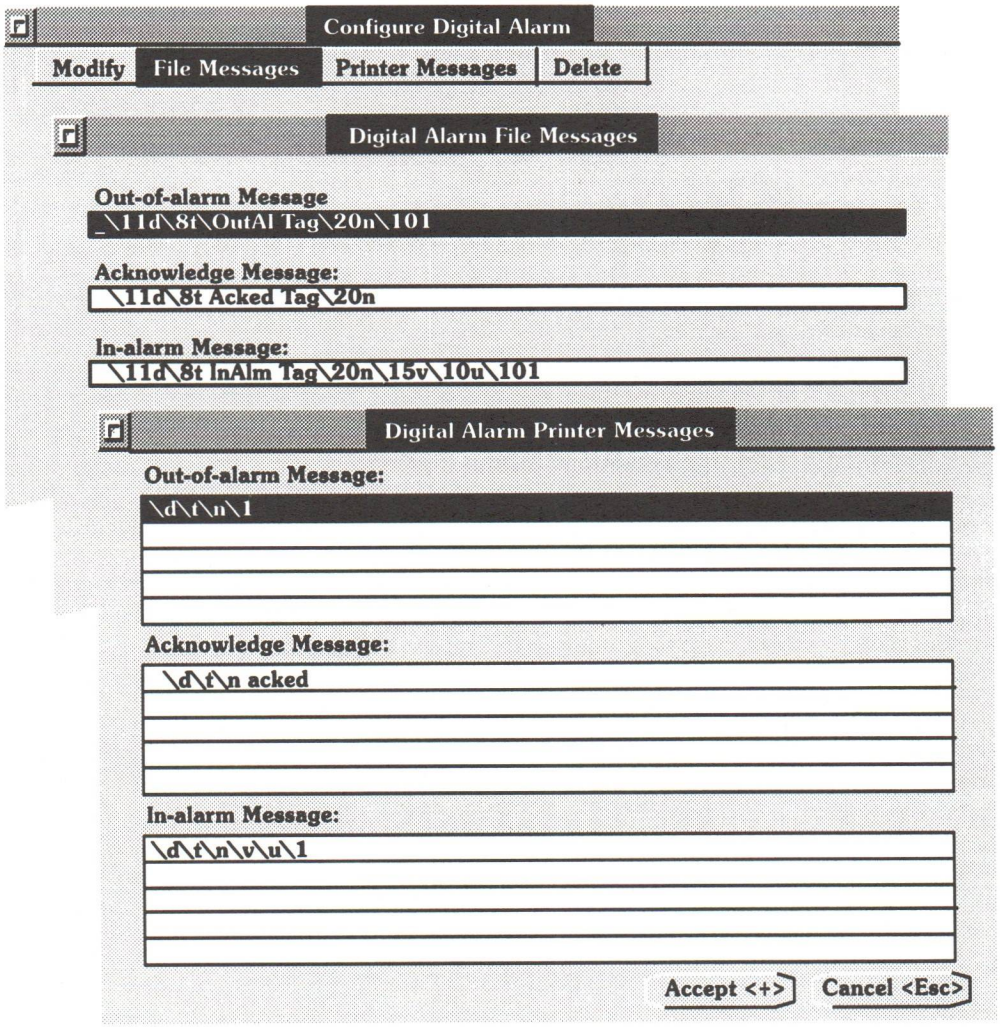
ATTENTION: If several tags name the same handshake bit, and some or all of them have auto-reset enabled, the handshake bit could switch off and on unpredictably. If you must use the same handshake bit for more than one alarm, be sure the programmable controller resets the handshake bit.

File and Printer Messages for Out-of-Alarm and Acknowledge

To create messages to send when the tag goes out-of-alarm, or when the operator acknowledges the alarm, choose *File Messages* in the Configure Alarm window.

Important: Do not create unique file messages for a tag if you intend to generate reports from the Alarm History log files. The Reporting option can only read the log files and produce reports if the messages are in the default format.

Figure 2.7
Digital Alarm File/Printer Message windows



- Out-of-Alarm Message

  The out-of-alarm message is logged when the monitored tag goes from being in-alarm to out-of-alarm.

- Acknowledge Message

  The acknowledge message is logged when the alarm condition is acknowledged by the operator.

Important: Out-of-alarm, alarm fault and acknowledge messages will only be sent to the printer or Alarm History log files if they have been configured to do so in the Alarm Severity Configuration window (Figure 2.9).

Configuring Alarm Severity

The Alarm Severity Table

Depending on the severity of an alarm, special messages can be sent to different destinations: to the Alarm History log files and to printers. You set up these messages and destinations in the Alarm Severity Table and its related windows. To open this window, choose *Configure Alarm Severity* under Configure in the Setup menu.

Figure 2.8
The Alarm Severity Table

Choose *Printer Messages* to define the printer messages based on severity.

Choose *File Messages* to define the file messages based on severity.

Choose *Logging Configuration* to define the alarm logging file set.

Choose *Modify* to set the color and logging destination for each severity.

Alarm Severity Table

Modify | Logging Configuration | File Messages | Printer Messages

			Logging Destinations				
	Severity	Colour	Summary	Printer	Disk	Bell	Ext. Bell
Hi	1	Red	Y	N	N	N	N
	2	Red	Y	N	N	N	N
	3	Red	Y	N	N	N	N
	4	Red	Y	N	N	N	N
	5	Red	Y	N	N	N	N
	6	Red	Y	N	N	N	N
	7	Red	Y	N	N	N	N
Lo	8	Red	Y	N	N	N	N

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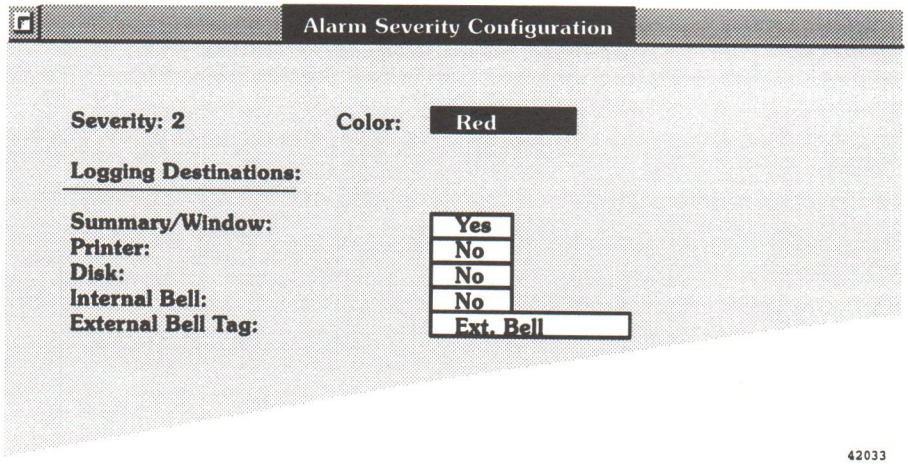
This window shows the current settings. To change a setting, choose the appropriate item from the menu These variables are defined in the Alarm Severity Configuration window.

Changing the Alarm Severity Configuration

Choose *Modify* in Alarm Severity Table. Choose a severity level. The Alarm Severity Configuration window will open, to edit the settings for all alarms of that severity.

Figure 2.9
The Alarm Severity Configuration window



- Color

  Select this field and press **Enter**, and choose from one of the available colors (red, yellow or blue). All alarm banner/summary messages of this severity will be displayed in the color you choose.

- Summary/Banner

  Enter *Yes* to have all alarms of this severity appear in the Alarm Summary and the Alarm Banner.

  Important: Alarms can only be acknowledged if they are sent to the Alarm Summary and Banner. Only specify No for those alarms which need never be acknowledged.

- Printer

  Select this field and press **Enter**, and choose from one of the available printers. All printer-directed messages for an alarm of this severity will be sent to the printer you choose. One of the choices is Default: the "default" printer is configured in the Alarm Logging Configuration window.

- Disk

  Choose *Yes* or *No*, to specify whether all alarms of this severity will be listed in the Alarm History Log files.

- Internal Bell

  Choose *Yes* or *No*, to specify whether all alarms of this severity will trigger the internal bell (see *Attaching the Internal Bell*, in this chapter).

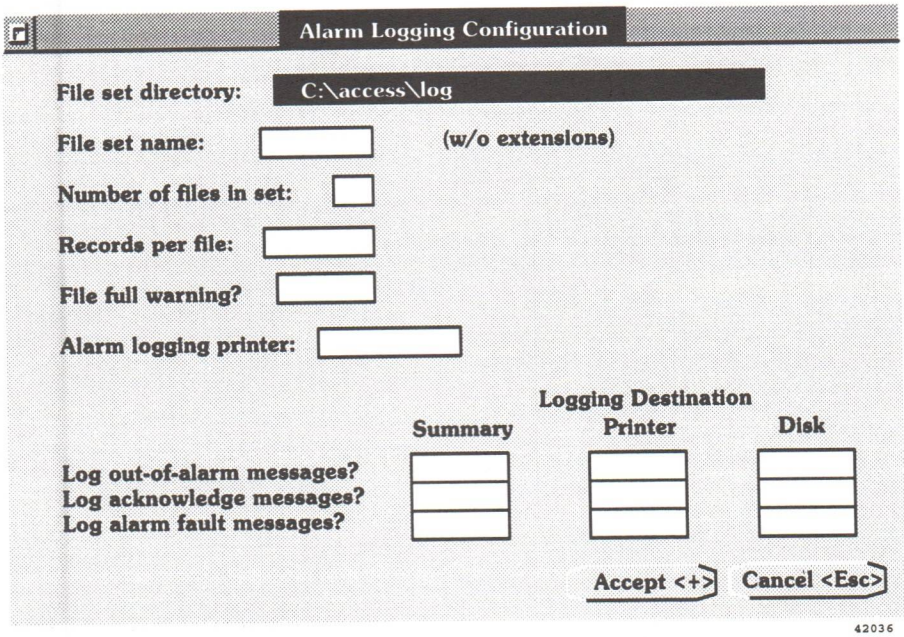
- External Bell

  Enter the name of a database tag in this field. This tag must refer to the address of a bit in the programmable controller that rings an alarm bell. It is up to the application or the operator to turn off this bell.

Logging Configuration

Choose *Logging Configuration* from the Alarm Severity Table. The Alarm Logging Configuration window opens, where you set the file name and other file attributes for the Alarm History log file set, and name the default alarm logging printer.

Figure 2.10
The Alarm Logging Configuration Window



- File set directory

  Enter the directory path for the alarm history log files. Don't change it if you prefer to use the original default directory. The default is C:\ACCESS\LOG\ where C is the drive where ControlView is installed.

Important: Whenever you configure a pathname, be sure to start with the drive letter. This is absolutely essential when running ControlView in a multi-drive environment.

- File set name

  Enter a filename, with no extension, for the alarm history log files. Don't change it if you prefer to stay with the default filename. Each file in the file set will have the same filename, with a numeric extension added, such as .000, .001, and so on.

- Number of files in set

  Enter a number, for the number of files in the alarm history log file set. For best use of disk space, it is advisable to keep the file set small—around five files. The maximum is 999 files.

- Records per file

  Enter a number for the number of alarm history records to be saved in each file. This determines the size of each file. Each logged event is one record.

  For best use of disk space, keep each file around 1000 records. At 80 bytes per record, this would consume 80k per file. The maximum is 9999 records per file. The maximum number records that can be saved in a file set, overall, is 30,000 records.

ATTENTION: If you change the *Number of files* or the *Records per file* settings for an existing log set, the original files will be destroyed when the new set is created.

- File full warning?

  Choose *Yes* to display a warning message when the last file in the file set is now being used, and first file will soon be overwritten. This allows you time to make a backup before any files are erased.

- Default alarm logging printer

  Choose one of the available printers. This printer will become the default printer for alarms of any severity; although in the alarm severity configuration this default setting can be changed, to send alarm messages of a specific severity to a specific destination..

- Logging Destination Fields: Summary, Printer, Disk

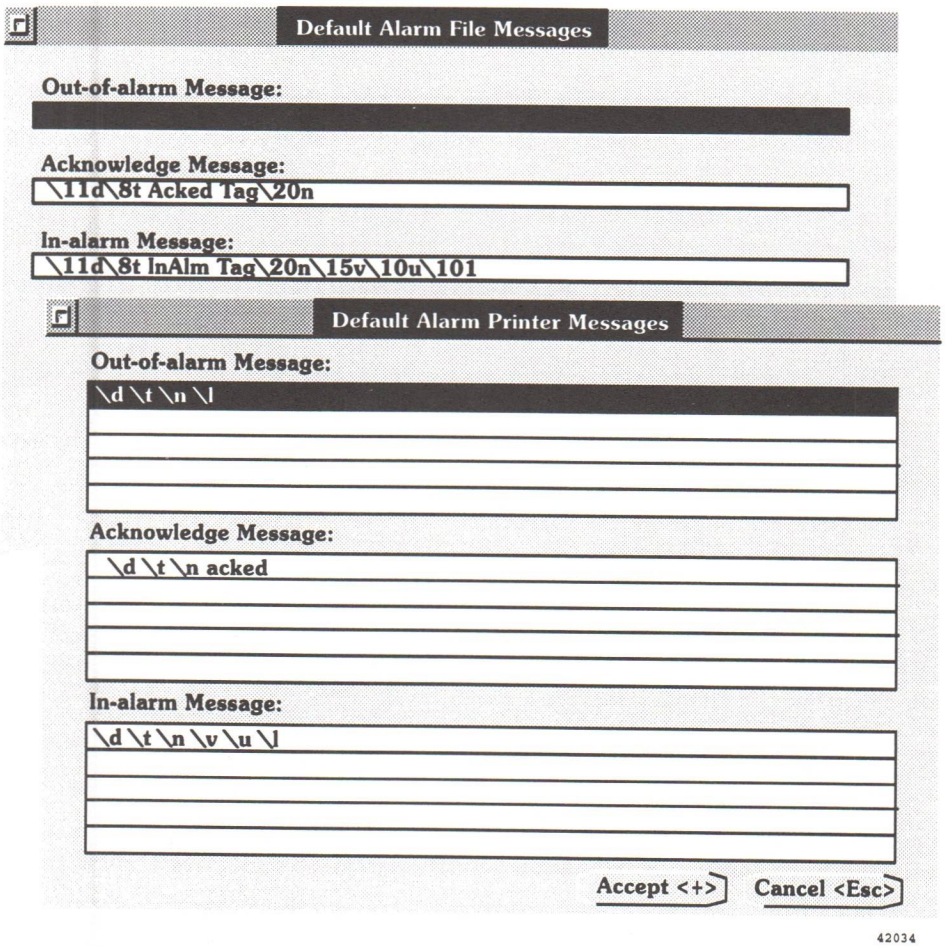
  Choose the destinations for out-of-alarm messages, acknowledged messages and alarm fault messages. All out-of-alarm, acknowledge, and alarm fault messages will be sent to these destinations, regardless of the alarm's severity.

Alarm File and Printer Messages

Wherever a special alarm message has not been created, a default message will be sent. There is a default alarm log file message and a default printer message for each of in-alarm, out-of-alarm, and for alarm acknowledgement. If you wish, you can create your own default messages.

Choose *File Messages* from the Alarm Severity Table to create default file messages, and *Printer Messages* to create default printer messages.

Figure 2.11
The Default Alarm File and Printer Messages windows



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Alarm Message Special Characters

Alarm messages can include special characters which are replaced by current information when the message is sent. These characters can be upper or lowercase, and must be preceded by a backslash (\).

\D	date when message is sent
\T	time when message is sent
\N	tag name of tag in alarm
\C	current value of tag in alarm
\V	threshold value that was crossed
\S	tag description of tag in alarm
\L	alarm label of current alarm
\U	units

Important: Alarm acknowledge messages can't use \C, \V, \S, \L or \U.

You can set a fixed spacing for the information generated by these characters, by putting a number between the backslash and the character. See the example below.

Important: The Reporting option can only produce reports from Alarm Log files which use the default order and spacing. Figure 2.11 shows the default formats.

Example: Special Characters

An out-of-alarm message could look like this while you are configuring the alarm:

```
\11D \8T Tag \10N is out of alarm.
```

When displayed it would look something like this:

```
Mar 09 1991 10:45:00 Tag PUMP3      is out of alarm.
```

Specifying wide spacing for special characters can create very long messages. In the example above, the tag name is allocated 10 spaces (\10N)

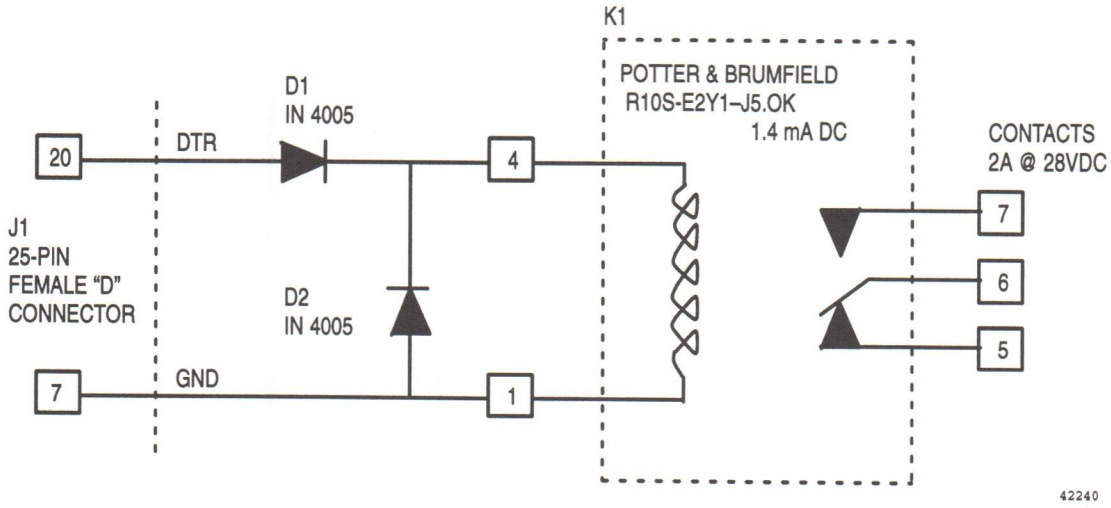
Attaching the Internal Bell

The Internal Bell is a relay that connects to two pins on the COM1 port. You must build a custom cable that connects the relay to the pins. When the internal bell is triggered, the DTR signal on COM1 goes high for one second, then goes back to low. The relay's contacts can be used to initiate a visual or audible alarm annunciator. All latching and unlatching of the signal must be done in the hardware circuit connected the COM1 port. The following illustration shows the connections.

Important: If MXCOM1 and IBMCOM1 exist, the system will use MXCOM1 instead of IBMCOM1.

Important: You cannot connect the relay and a mouse to the same port.

Figure 2.12
Alarm Contacts on the COM1 Port



Chapter 3

Managing the Alarm System

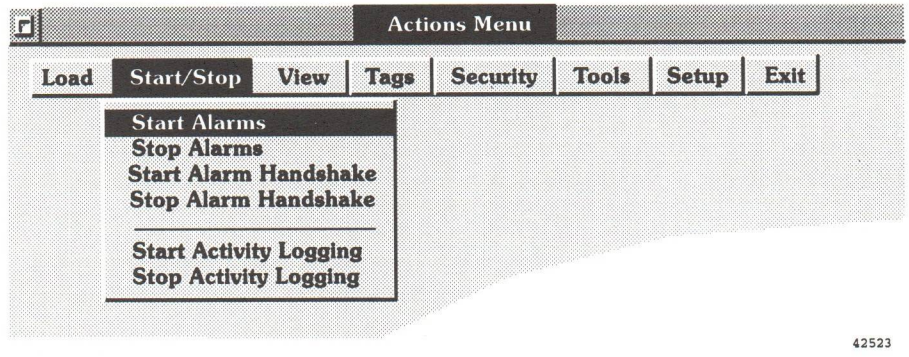
This chapter describes how to monitor and manage alarm conditions.

You can only start alarm detection on a database that has some tags configured for alarms.

Start/Stop Monitoring Alarms

Choose *Start Alarms* to start monitoring for alarms. Choose *Stop Alarms* to stop alarm detection

Figure 3.1
The Start/Stop Menu

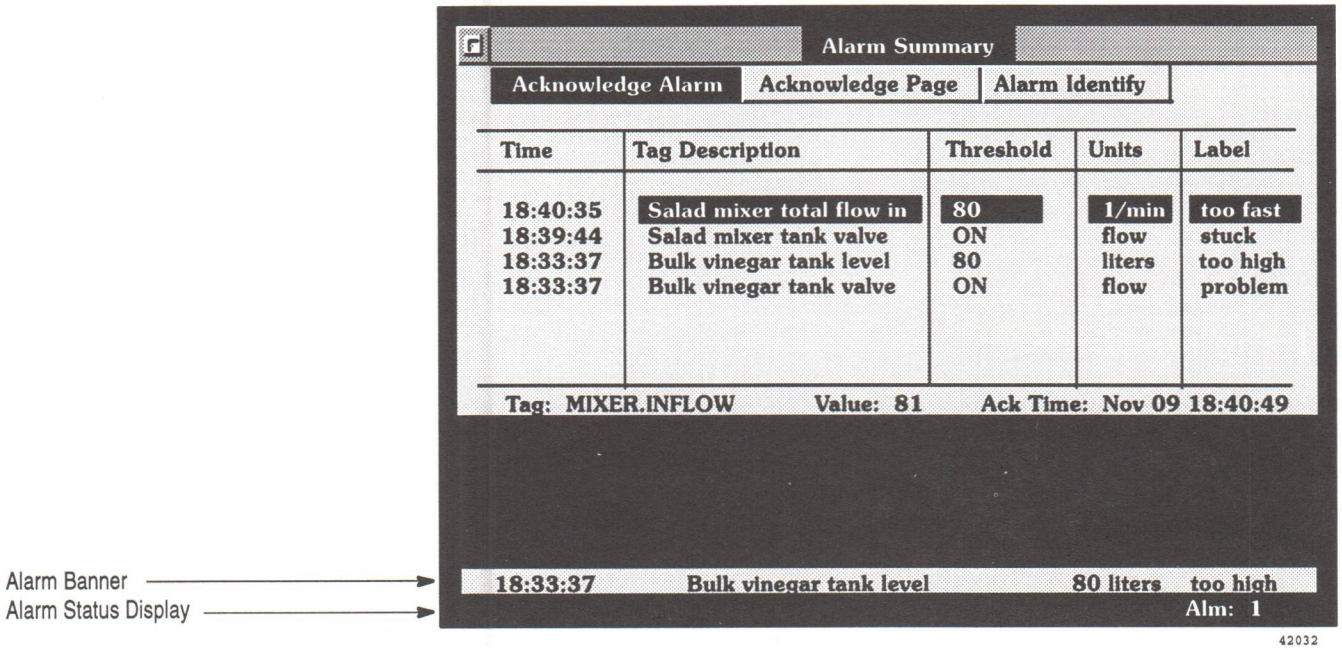


The Alarm Displays

There are three alarm displays:

- Alarm Status
- Alarm Banner
- Alarm Summary

Figure 3.2
The Alarm Summary with Alarm Banner and Status Display



The Alarm Status Display

The Alarm Status display automatically appears at the bottom of the screen whenever an alarm occurs. It shows the number of unacknowledged alarms and the number of suppressed alarms. It does not show out-of-alarm transactions, but gives the operator an indication of alarm activity without calling up the Alarm Summary display.

The Alarm Banner

Like the Alarm Status Window, the Alarm Banner is displayed automatically at the bottom of the screen. When an alarm is reported, a single message is displayed to show the most recent, highest severity alarm. It remains unchanged until:

- it is acknowledged by the operator
- it is replaced by a more recent alarm of equal or greater severity

The color of the text shows the alarm's severity (the severity colors are part of the alarm severity configuration).

Important: The Alarm Banner does not show when the Mouse GRAFIX Editor is on-screen. Editing Mouse GRAFIX while the system is online and scanning programmable controllers is not recommended.

The Alarm Summary

To call up the Alarm Summary, choose *View Alarm Summary* under View in the Actions menu. The Alarm Summary shows comprehensive information on outstanding alarms, allows alarm acknowledgement and allows you to run alarm IDENTIFY macros or commands.

You can also use the the SUMMARY command to call up the Alarm Summary; with the command you can use parameters to specify the size of the alarm summary.

In the Alarm Summary, the alarms are listed in order of occurrence, with the most recent alarm at the top. A detail line at the bottom shows more complete information on the highlighted alarm.

Important: The highlighted alarm is always on screen. If the alarm that is highlighted is more than one screenful from the top of the list, a new alarm might not be visible when it appears. Watch the Alarm Banner for any newly occurring alarms.

Alarm Identify

There are three ways to run the IDENTIFY command or macro for an alarm:

- double-click on the highlighted alarm
- highlight an alarm and choose *Alarm Identify*
- call up the command line and use the IDENTIFY command

Alarm Acknowledgement

You can acknowledge a single alarm or several:

- highlight an alarm and choose *Alarm Acknowledge*
- choose *Acknowledge Page* to acknowledge all alarms that are currently on-screen in the Alarm Summary
- call up the command line and use the ACKNOWLEDGE command
- call up the command line and use the ACKNOWLEDGEALL command

- When the Alarm Summary is not displayed, you can go to the Tags menu in the Action menu and choose *Acknowledge Alarm*

Important: You can only acknowledge alarms sent to the Alarm Display/Summary. A maximum of 440 tags in alarm can be maintained in the Alarm Summary at one time. When the Summary becomes full, the last listing is removed to make room for the new ones. No warning or error message is given before this happens.

Suppressing Alarms

You can suppress alarms to avoid needless alarm triggering during testing or routine maintenance. You suppress alarms from the Actions menu or with the SUPPRESSON command. To suppress alarms:

- choose *Suppress Alarms* in the Tags menu
- use the SUPPRESSON command, using its parameters to specify a tag or group of tags

To display a list of suppressed alarms, use the SUPPRESSED command.

Restoring Suppressed Alarms

To restore alarms to alarm detection, choose *Stop Alarm Suppression* in the Tags menu or use the SUPPRESSOFF command.

Appendix A

Commands

ACKNOWLEDGE

ACKNOWLEDGE [*tag*]

Acknowledges an alarm or a group of alarms. A maximum of 440 tags can be acknowledged at one time. This command gives no indication that it has been executed but will display an error message if not executed properly.

Examples: The ACKNOWLEDGE Command

`ACKNOWLEDGE loop3.pv`
Acknowledges all outstanding alarms for the tag *loop3.pv.*

`ACKNOWLEDGE loop.*`
Acknowledges all outstanding alarms for all the tags in the group *loop*.

`ACKNOWLEDGE +`
Acknowledges all outstanding alarms. The database must have no more than 1000 tags monitored for alarms.

`ACKNOWLEDGE [tag]`
Acknowledges alarms for the tag associated with the currently highlighted object in the current Mouse GRAFIX display.

`ACKNOWLEDGE`

Acknowledges the tag currently displayed in the alarm banner. This is always the most recent, unacknowledged alarm with the highest severity.

Important: In situations where alarms are occurring rapidly, don't run the ACKNOWLEDGE command without a specific tag name. The ACKNOWLEDGE command could acknowledge a newly arrived alarm, rather than the alarm that was intended.

ACKNOWLEDGEALL

ACKNOWLEDGEALL

Acknowledges all outstanding alarms. This command executes more quickly than ACKNOWLEDGE +, and is not limited to 1000 tags. It gives no indication that it has been executed but will display an error message if not executed properly.

ALARM

ALARM

Calls up the Alarm Severity Table editor, where attributes related to alarm severity class—color, logging destinations, and internal and external bells—are configured.

ALARMOFF

ALARMOFF

Stops alarm monitoring. This command gives no indication that it has been executed but will display an error message if not executed properly.

ALARMON

ALARMON [*/h*]

Starts alarm monitoring. This command gives no indication that it has been executed but will display an error message if not executed properly.

/h	turns on handshaking at the moment alarming starts, and also sets the handshake bit for any tags which are in alarm at the moment that alarm monitoring begins

HANDSHAKEOFF

HANDSHAKEOFF

Disables alarm handshaking, regardless of whether the individual handshake bits are configured. This command gives no indication that it has been executed but will display an error message if not executed properly.

HANDSHAKEON

HANDSHAKEON

Enables alarm handshaking. By default this setting is off. Handshaking can be disabled with the HANDSHAKEOFF command. This command gives no indication that it has been executed but will display an error message if not executed properly.

IDENTIFY

IDENTIFY [*tagname*]

Executes the command or macro associated with the named alarm, whether or not the tag is actually in alarm.

Running the IDENTIFY command is not the same as acknowledging an alarm.

Important: The command does not accept wildcards.

Examples: The IDENTIFY Command

`IDENTIFY loop3.pv`
Executes the IDENTIFYcommand or macro for the tag *loop3.pv,* whether or not the tag is in alarm.

`IDENTIFY [tag]`
Executes the IDENTIFY command or macro for the selected tag in the current Mouse GRAFIX display.

`IDENTIFY`
Executes the IDENTIFY command or macro for the tag currently displayed in the Alarm Banner.

Important: When many alarms can occurring rapidly, do not run the IDENTIFY command without a specific tagname. Before the IDENTIFY command is executed, a new alarm could become the current alarm, and the command or macro that runs may not be the one you expected.

SUMMARY

SUMMARY [*lines*]

Displays the Alarm Summary, where *lines* (a number from 1 to 16) defines the size of the window. If you specify 1, the alarm summary displays only one alarm, and takes up less than 1/4 of the screen.

Examples: The SUMMARY Command

SUMMARY
Brings up the Alarm Summary display with room for 16 lines of alarm information.

SUMMARY 5
Brings up the Alarm Summary display, with room for 5 lines of alarm information.

SUPPRESSED

SUPPRESSED

Displays the Alarm Suppression List which lists the tag names and descriptions of all alarms which are suppressed.

SUPPRESSOFF

SUPPRESSOFF *<tag>*

Restores alarm reporting for a suppressed alarm. To suppress alarms use the SUPPRESSON command.

Wild cards may be used.

Examples: The SUPPRESSOFF Command

SUPPRESSOFF INTAKE.LOOP?.ALM
Restores alarm reporting of all the loop handshake bits in the intake group.

SUPPRESSOFF +
Restores alarm reporting for suppressed tags. The database must have no more than 1000 tags monitored for alarms.

SUPPRESSON

SUPPRESSON *<tag>*

Suppresses the reporting of alarms for the tag(s) specified. This is useful when equipment repairs or maintenance would otherwise result in alarms being generated. All alarms for each threshold of the monitored tag are suppressed.

Alarms can be suppressed any time after a database has been loaded. Alarm suppression can take place before or after the ALARM command has been issued. To restore alarm reporting, use the SUPPRESSOFF command. Wild card characters may be used.

Examples: The SUPPRESSON Command

`SUPPRESSON INTAKE.LOOP?.ALM`
Suppresses alarms for all the loop handshake bits in the intake group.

`SUPPRESSON +`
Suppresses alarm reporting for all monitored tags. The database must have no more than 1000 tags monitored for alarms.

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